

HOW LABOR FORCE PARTICIPATION MEDIATES POVERTY RATE BY OTHER FACTORS

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Abstract:

This research examines the factors that influence poverty levels in Indonesia, both directly and indirectly, by analyzing the involvement of labor force participation levels. The study uses BPS data and the APBN Data Portal to evaluate wages, education, and government spending in the education and health sectors as influencing variables. Using time series data, this research form by path analysis aims to identify direct or indirect relationships between variables. The data is first analyzed using descriptive statistical analysis as part of the research methodology. This research using path analysis and the Sobel test, researchers found that education levels only up to junior secondary school have an impact on changes in labor force participation rates but do not have an impact on reducing poverty. In contrast, other variables, such as wages and government spending in the education and health sectors, do not indirectly affect poverty through the labor force participation rate.

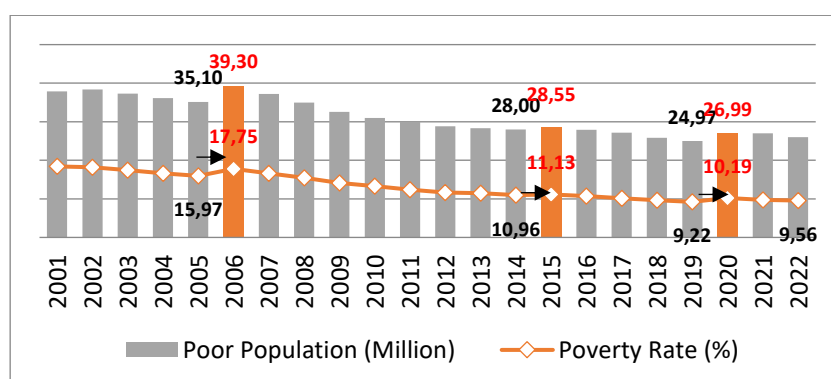
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INTRODUCTION

Reducing poverty rates has been a challenging task, particularly given that around 30 percent of the population remains vulnerable to poverty (World Bank, 2020). In the past two decades, the decline in poverty rates has not been smooth. For instance, starting in 2005, there was an increase in poverty levels, mainly attributed to high fuel prices and escalating rice prices (Setyadi & Indriyani, 2021). Likewise, in 2015, there was an increase in poverty rates caused mainly by the agricultural sector (Ikhwan & Siradjuddin, 2017). Moreover, the COVID-19 pandemic that emerged in early 2020 significantly impacted poverty levels, causing a further increase in poverty rates (Izzati, 2021).



Source: BP S-Statistics Indonesia (2023)

Figure 1. Poverty Rate and Total of Poor Population in Indonesia 2001-2022

In 2006, the beginning of the highest increase in the poverty rate, reaching 17.75 percent with an increase in the number of poor people of 4.20 million people. After the crisis was resolved, poverty decreased slowly until it reached a value of 10.96 in 2014. The lowest point, the poverty rate, decreased further in 2019 to 9.22 percent. However, when the COVID-19 pandemic in March 2020 began to enter Indonesia, the poverty rate again reached 10.19 in 2020 until it decreased to 9.56 in 2022.

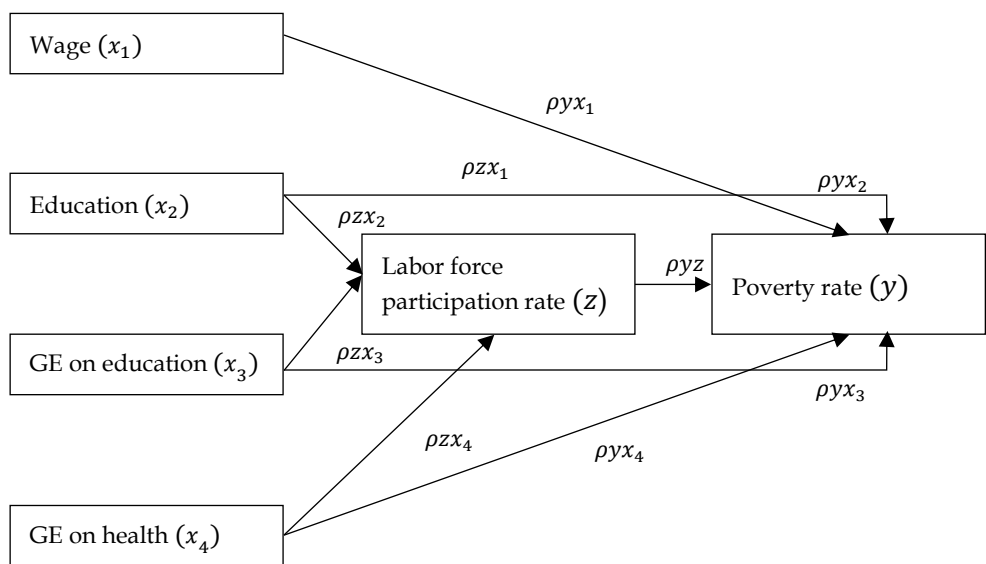
One of the main mechanisms in developing countries to reduce poverty is providing employment opportunities for the low-middle class (Putra & Arka, 2018). According to various studies, the labor force participation rate significantly reduces poverty levels (Priebe et al., 2014; Rammohan & Tohari, 2023; Saifuloh et al., 2019). With ample employment opportunities, more people can earn an income to support themselves and their families. It, in turn, can improve their welfare and help reduce the poverty rate (Febriandika et al., 2022). However, it is essential to note that high labor force participation may also impact several other poverty-related factors.

Based on several studies, it was found that poverty in Indonesia is caused by many factors, including wages, economic growth, education, health, and government regulations (Bonneri et al., 2018; Fithri & Kaluge, 2017; Rahmi & Riyanto, 2022; Tanjung, 2020). Compared to the previous papers the researchers have reviewed, this paper provides a research gap, which involves labor force participation as a mediating variable in all variables to review its influence on poverty levels in Indonesia. This paper aims to investigate the relationship between the labor force participation rate, poverty levels, and other factors in Indonesia by using a causality approach with macro, secondary data covering all provinces from 2001 to 2022.

METHODS

This paper uses secondary data from the BP S-Statistics Indonesia and APBN Data Portal. Using time series data, this research form by path analysis aims to identify direct or indirect relationships between variables. In situations where complex relationships between variables cannot be resolved through multiple regression, path analysis can be used as an alternative method (Gudono, 2012). Path analysis is a statistical technique that can help to determine the strength and direction of the relationships between variables and provide insights into the underlying mechanisms that drive these relationships.

The data is first analyzed using descriptive statistical analysis as part of the research methodology. This technique provides an overview of the data by calculating essential measures such as the minimum, maximum, average value (mean), and standard deviation. Since the research involves path analysis with multiple variables with different units of measurement, the data is then transformed into Ln (Natural Logarithm) form to normalize the data distribution and reduce the scale of the data. This step makes it possible to represent the data using a path analysis model, which helps understand how the different variables influence each other.



Source: Data processed (2023).

Figure 2. Path Analysis Model

Based on the path analysis model, the structural model is divided into two models, which are the dependent variable (poverty rate) and intervening variable (labor force participation rate), which can be described as follows:

The first model:

$$y = \alpha_1 + \beta_1 Lnx_1 + \beta_2 x_2 + \beta_3 Lnx_3 + \beta_4 Lnx_4 + \beta_5 z + \varepsilon_1$$

The second model:

$$z = \alpha_2 + \beta_6 Lnx_1 + \beta_7 x_2 + \beta_8 Lnx_3 + \beta_9 Lnx_4 + \varepsilon_2$$

In that equation, α_1 and α_2 are the y and z intercepts and refer to the estimated value of y or z when x equals 0. The coefficients β1 – β9 are the regression coefficients and denote the estimated increase in the dependent variable for every unit increase in the independent variable. The symbol ε is a random error component. It signifies imprecision of regression, indicating that, in actual practice, the independent variables cannot perfectly predict the change in any dependent variable. Those variables are: poverty rate as dependent variable (y), the labor force participation rate as intervening variable (z), then wage minimum (x1), education (x2), and government expenditure on education and health (x3 and x4) as independent variables.

Table 1. Direct Effect Between Dependent, Intervening, and Independent Variables

	Poverty Rate (y)	Labor Force Participation Rate (z)
Wages (Lnx ₁)	ρyLnx ₁	ρzLnx ₁
Education (x ₂)	ρyx ₂	ρzx ₂
Gov. Exp. on Education (Lnx ₃)	ρyLnx ₃	ρzLnx ₃
Gov. Exp. on Health (Lnx ₄)	ρyLnx ₄	ρzLnx ₄
Labor Force Participation Rate (z)	ρyz	

Source: Data processed (2023).

A research hypothesis test was conducted to determine the impact of independent variables on the model and to understand the extent of their influence on the dependent variable. The test used two types of analysis –the partial test or t-test and the Sobel test or mediation effect test –to show the relationship between variables. For the t-test, the researchers have used a significance level of 0.05, which means the hypothesis will be accepted if the p-value (sig.) exceeds the specified significance level. The analysis aimed to establish whether or not the independent variables had a significant impact on the model and to determine their influence on the dependent variable.

Sobel test hypothesis testing can be done using,

$$Sab = \sqrt{b^2 Sa^2 + a^2 Sb^2 + Sa^2 Sb^2} \qquad \text{then,} \qquad z = \frac{ab}{Sab}$$

Are; Sab is the standard error size of the indirect effect, a is the path of the independent variable (x) with intervening variable (z), b is the path of intervening variable (z) with the dependent variable (y), and, Sa and Sb are standard error coefficient a and b. Then, the symbol z is the value to be compared with the z-score, so it would determine whether a mediating effect or influence exists.

RESULT AND DISCUSSION

Descriptive Analysis. Table 1 shows the results of the descriptive analysis processed using Excel 2016 software. In this research, descriptive statistics is used to explain the characteristics of variables, such as minimum value, maximum value, mean, and standard deviation.

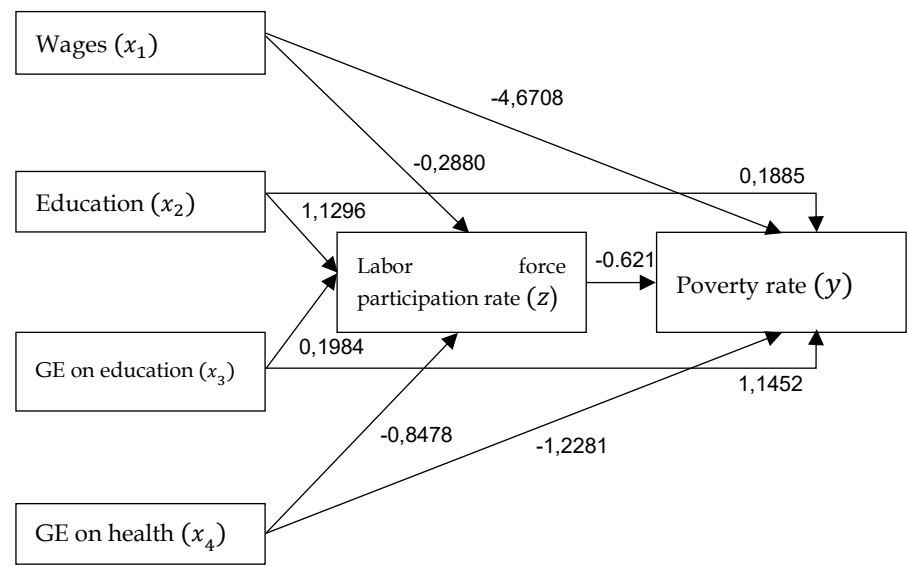
Table 2. Descriptive Analysis

	N	Minimum	Maximum	Mean	Std. Deviation
Wages	22	290500	2736463	1344029,318	857922,5188
Education	22	7	8,69	7,682727273	0,572431587
Gov. ex. education	22	11,18	550	256,4122727	187,7698869
Gov. ex. health	22	2.906	176.721	59504,86364	57963,2919
Labor force part. rate	22	65,76	68,85	67,28318	0,76904
Poverty rate	22	9,22	18,41	13,21045455	3,248003749
Valid N (Listwise)	22				

Source: Data processed (2023).

Based on Table 2, it can be explained that the amount of data used is 22. First, the wage variable (x1) in thousand rupiahs has a minimum value of 290.500 while the maximum value is 2.736.463 with an average value of 1.344.029,3. Second, the education variable (x2) in years has a minimum value of 7, while the maximum value is 8,69, with an average value of 7,68. Third, the variable government expenditure in the education sector (x3) in billions of rupiah has a minimum value of 11,18, while the maximum value is 550 with an average value of 256,41. Fourth, the variable government expenditure in the health sector (x4) in units of trillion has a value of 2.906 while the maximum value is 176.721 with an average value of 59.504,86. Fifth, the labor force participation rate (z) variable with percentage units has a minimum value of 65,76 while the maximum value is 68,85 with an average value of 67,28. Sixth, the poverty rate (y) in percentage units has a minimum value of 9,22 while the maximum value is 18.41 with an average of 13,21.

Path Analysis. Here is a diagram representing the results of path analysis estimation using STATA 13. This diagram displays the influence of wages, education, government expenditure on the education sector, and government expenditure on the health sector on poverty through the labor force participation rate.



Source: Data processed (2023).

Figure 3. Path Analysis Model

Based on the results of the diagram of path analysis, the regression equation can be rewritten with two models, as follows, the first model:

$$y = 111,501 - 4,6708x_1 + 0,1885x_2 + 1,1452x_3 - 1,2282x_4 - 0,612z + \varepsilon_1$$

Based on the first model, it explains how all variables affect poverty (y), including the mediating variables. The analysis shows that wages (x1) significantly influence and hurt poverty (y). The government spending in the health sector (x4) and labor force participation rates (z) also show similar results. On the other hand, education (x2) and government spending in the education sector (x3) show an increasing poverty level when these independent variables decrease.

The second model:

$$z = 62,87726 - 0,2879x_1 + 1,2963x_2 + 0,1984x_3 - 0,84781x_4 + \varepsilon_2$$

However, in the second model, it was observed that wages (x1) and government expenditure on health (x4) have a negative influence on the labor force participation rate (z). Increasing these independent variables will reduce the labor force participation rate (z). On the other hand, an increase in education (x2) and government spending in the education sector (x3) have a positive influence on the labor force participation rate (z), according to education, that have the dominant value.

Hypothesis tests. After analyzing the structural model between variables, the results are used to test the hypothesis and measure the direct influence between variables. The conclusions of hypothesis testing are drawn from the path coefficient values and significant values for each path

studied. The first test reviews the direct influence between variables or the t-test, while the second reviews the indirect influence through mediating variables or the Sobel test.

Table 3. t-Test Result 1

Model Structural I	Coef.	OIM Std. Err.	z	Sig.
(Constant)	111,501	15,33419	7,27	0,000
ln_wages	-4,6707	0,8938463	-5,23	0,000
education	0,18853	0,6036149	0,31	0,755
ln_govexeducation	1,1452	0,3278343	3,49	0,000
ln_govexhealth	-1,2282	0,459909	-2,67	0,008
labor force	-0,612	0,2109875	-2,90	0,004
Dependent Variable: Poverty Rate				

Source: Processed by STATA 13 (2023).

In Table 3, the findings of the t-test are presented, which indicate the connection between wages, education, government spending in the education and health sectors, and the labor force participation rate on poverty levels. The first column of the table shows the average provincial minimum wage as a measure of wages. A negative wage coefficient implies that higher wages can lead to a decrease in poverty levels. It was found that the minimum wage has a significant influence in reducing poverty levels, indicating a dominant impact overall.

The second column indicates that education, measured by the average number of years of schooling, has no significant influence on poverty-level changes. Surprisingly, the analysis suggests that individuals who have the opportunity to pursue higher education may not be able to reduce poverty. These results are similar to the findings of Mardiyana and Ani (2018), who argued that the length of education has no significant impact on poverty.

The analysis of government spending in the education sector showed a significant coefficient of 1.1452 with a significance level of 0.000, indicating a positive relationship with the poverty level. The variable is measured from the total education budget, suggesting that increasing government spending in the education sector directly impacts increasing poverty levels. This result contrasts the findings of Hidalgo (2018), who argued that the government's efforts to improve the quality of education through the budget significantly reduced poverty levels.

Fourth, the government expenditure variable in the health sector has a significant negative impact with a coefficient value of 1.2282. This influence explains how government spending in the health sector affects poverty. Therefore, increasing the health sector's budget spending is an effective way to reduce poverty rates.

With a negative value, the labor force participation rate shows a significant impact with a coefficient of 0.612. The labor force participation rate is the percentage of the total labor force divided by the number of residents aged ten years and over. These results indicate that a high labor force participation rate positively impacts reducing poverty.

Table 4. t-Test Result 2

Model Structural II	Coef.	OIM Std. Err.	z	Sig.
(Constant)	62,8773	7,771068	8,09	0,000
ln_wages	-0,28791	0,9011344	-0,32	0,749
education	1,12963	0,543741	2,38	0,017
ln_govexeducation	0,19843	0,3285607	0,60	0,546

ln_govexhealth	-0,84781	0,4281414	-1,98	0,087
Dependent Variable: Labor Force Participation Rate				
Source: Processed by STATA 13 (2023).				

Compared to the first model, the second model reveals that most independent variables do not affect the labor force participation rate. The wage variable, with a sig. A value of 0.749 indicates no significant effect on the labor force participation rate. Siregar (2020) stated in his findings that increasing the minimum wage only sometimes brings positive changes for workers, as the implementation of the minimum wage only applies to some work groups. The difficulty of implementing the minimum wage and the lack of information regarding this regulation means that not all groups feel wage increases.

In contrast to the previous model, education significantly impacts labor force participation. With a coefficient value of 1.1296, this indicates that every increase produced by the education variable will increase labor force participation. Specifically, this means that the longer an individual pursues education, the higher their chances of being absorbed into the job market. The labor force participation rate has a robust and direct relationship with educational attainment levels; the higher the educational attainment, the higher the labor force participation rate.

According to Hajebi et al. (2023), government spending in the education sector can influence people to improve their education level, positively impacting national development. However, the study found that government spending in the education and health sectors did not significantly impact the labor force participation rate. The study highlighted the importance of optimal budget allocation, not just a large budget. Similarly, Hastuti et al. (2020) argue that the government's inability to support health services through the budget is due to the need for a priority scale to prioritize the quality of public services. The study also pointed out that the government tends to prioritize physical development facilities over the quality of public services. Additionally, the lack of involvement of the community and community organizations has also hindered the achievement of quality public services.

Table 5. Sobel-Test Result

	<i>a</i>		<i>b</i>	
	Coef.	Std. Err.	Coef.	Std. Err.
ln_wages	-4,670761	0,8938463	-0,2879052	0,901134
education	0,188536	0,6036149	1,2962930	0,54374
ln_govexeducation	1,145194	0,3278343	0,1984339	0,328561
ln_govexhealth	-1,228155	0,459909	-0,8478109	0,428141
Dependent Variable	Poverty Rate		Labor Force Part. Rate	

Sobel-Test			
	<i>ab</i>	<i>Sab</i>	z-test
ln_wages	1,344736	4,293083	0,313233
education	0,374027	0,178364	2,096986
ln_govexeducation	0,227245	0,396749	0,572768
ln_govexhealth	1,041243	0,683591	1,523195

Source: Data processed (2023).

Based on Table 5, the results of the Sobel test can be shown by comparing the calculated z-test for each variable with the table z-score of 1.96. If an independent variable indirectly influences

poverty through the labor force participation rate, it will have a z-test greater than the z-score. The table shows the z-test for each independent variable, revealing that only the education variable has a value greater than the z-score, specifically 2.096986. Therefore, this study concludes that only education positively affects poverty through the labor force participation rate.

CONCLUSION

The research findings show that several factors have a very different impact in theory. One of the exciting results is that education is still considered unable to reduce poverty. In contrast, on the level of labor force participation, education shows its influence in increasing the level of labor force participation. It is also found that other factors, besides education, do not influence labor force participation rate changes. The Sobel test shows that only education can indirectly affect poverty through the labor force participation rate. However, the effect given differs from what was expected based on theory.

1. In Indonesia, the average length of education still needs to be increased to reduce poverty compared to other factors such as the minimum wage, government spending in the education and health sectors, and the labor force participation rate. Indonesia's average level of education is only up to the junior secondary level, which needs to be improved to support maximum individual productivity in efforts to overcome poverty in the country. It highlights the need for increased investment in education and human capital development, which can ultimately lead to poverty reduction and economic growth.
2. Despite Indonesia's relatively low level of education, it is still considered a factor that impacts changes in labor force participation rates. According to BPS data, the informal sector tends to dominate over the formal sector, which illustrates how low levels of education can be absorbed into labor force participation. Increasing education levels can indirectly improve labor force participation rates. In contrast, other factors, such as minimum wages and government spending in the education and health sectors, have a less direct impact on the labor force participation rate due to the dominance of the informal sector. Workers in the informal sector tend to have lower wages and less access to government services and benefits, which can hinder their ability to participate in the formal labor force.
3. Despite the government's efforts to reduce poverty rates in Indonesia through minimum wage policies and increased budget allocations in the education and health sectors, these measures have yet to improve labor force participation rates. The need for optimization in the distribution of expenditure budgets in these sectors directly impacts the quality of education and health services provided, resulting in lower human capital development and high poverty rates.

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